

PROJECT NAME

HYDRA

BASED ON

Catalinbread Naga Viper

EFFECT TYPE

Treble Booster

AION
DIY GUITAR EFFECTS

BUILD DIFFICULTY

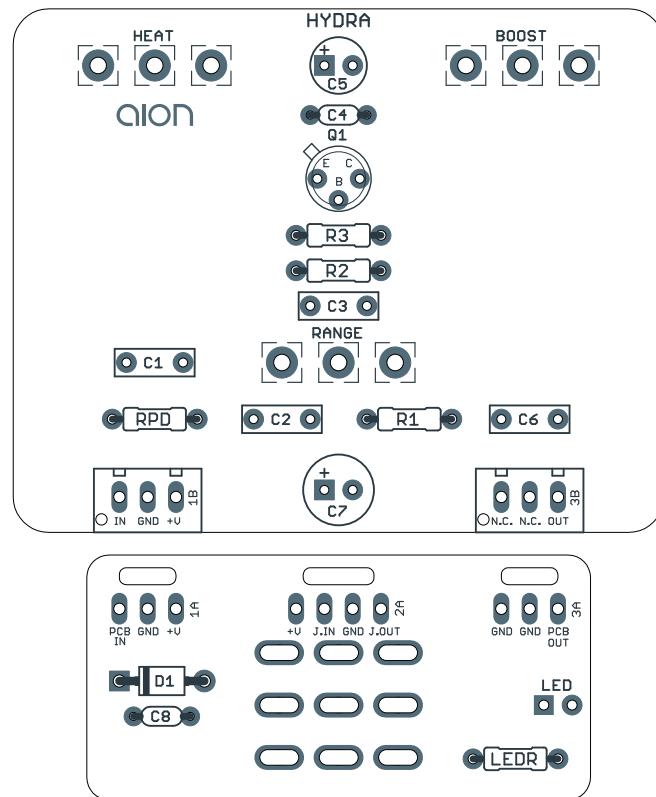
||||| Beginner

DOCUMENT VERSION

1.0.0 (2019-11-28)

PROJECT SUMMARY

A silicon adaptation of the classic Dallas Rangemaster circuit with a few hot-rod modifications for added flexibility.



Actual size is 2.3" x 1.86" (main board) and 1.78" x 0.86" (bypass board).

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INTRODUCTION

The Hydra Treble Booster is an adaptation of the Catalinbread Naga Viper, itself based on the Dallas Rangemaster, but with an NPN silicon transistor instead of the PNP germanium of the original.

Although it's referred to as a treble booster, there's nothing clean about it. It's very much in the overdrive territory, not quite full-on fuzz but in the same tradition.

The Naga Viper adds versatility to the one-knob Rangemaster design by including an input capacitor blend (labeled "Range") to go between treble boost and full-frequency boost. Fully clockwise is the same as the stock Rangemaster.

There is also an added gain/saturation control (labeled "Heat") to allow the transistor gain to be dialed back from the fixed full-gain setting of the original. As with the Range control, when set fully clockwise, it's the same setup as the stock Rangemaster.

Despite the two additions, it remains a very low parts-count circuit and great for beginners chasing some of the classic sounds of the 1960s.

The Hydra project is a direct adaptation of the Naga Viper with no modifications or changes.

USAGE

The Hydra has the following controls:

- **Range** is a tone control, with full-frequency on one end and treble-emphasized on the other.
- **Heat** sets the gain of the transistor. Fully clockwise, it's similar to the original Rangemaster.
- **Boost** is a combination of gain and output volume.

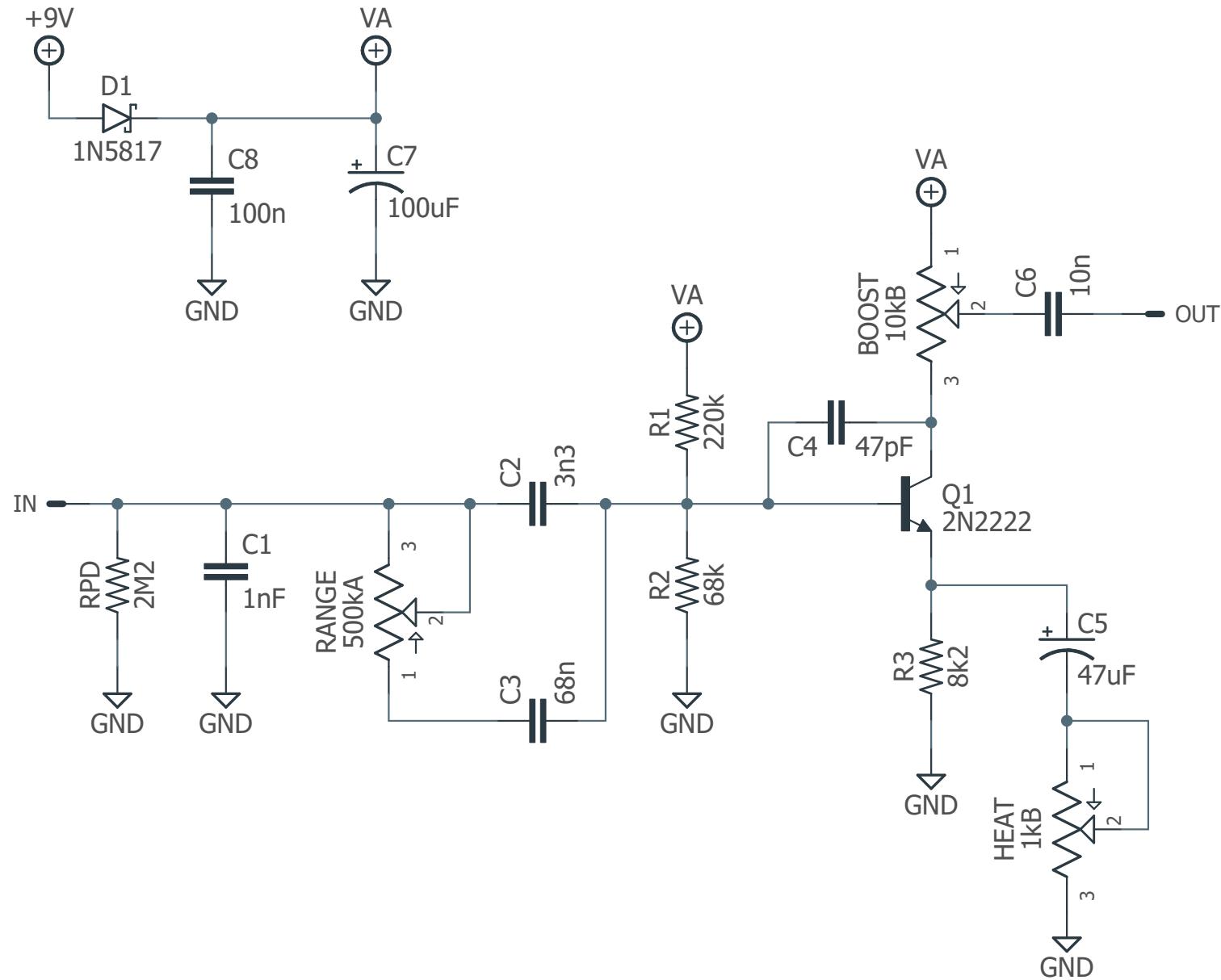
PARTS LIST

This parts list is also available in a spreadsheet format which can be imported directly into Mouser for easy parts ordering. Mouser doesn't carry all the parts (most notably potentiometers) so the second tab lists all the non-Mouser parts as well as sources for each.

[View parts list spreadsheet →](#)

PART	VALUE	TYPE	NOTES
R1	220k	Metal film resistor, 1/4W	
R2	68k	Metal film resistor, 1/4W	
R3	8k2	Metal film resistor, 1/4W	
RPD	2M2	Metal film resistor, 1/4W	Input pulldown resistor.
LEDR	4k7	Metal film resistor, 1/4W	LED current-limiting resistor. Adjust value to change LED brightness.
C1	1n	Film capacitor, 7.2 x 2.5mm	
C2	3n3	Film capacitor, 7.2 x 2.5mm	
C3	68n	Film capacitor, 7.2 x 2.5mm	
C4	47pF	MLCC capacitor, NP0/COG	
C5	47uF	Electrolytic capacitor, 5mm	
C6	10n	Film capacitor, 7.2 x 2.5mm	
C7	100uF	Electrolytic capacitor, 6.3mm	Power supply filter capacitor.
C8	100n	MLCC capacitor, X7R	Power supply filter capacitor.
D1	1N5817	Schottky diode, DO-41	
Q1	2N2222	BJT transistor, NPN, TO-18	
BOOST	10kB	16mm right-angle PCB mount pot	
HEAT	1kB	16mm right-angle PCB mount pot	
RANGE	500kA	16mm right-angle PCB mount pot	
LED	5mm	LED, 5mm, red diffused	
IN	1/4" stereo	1/4" phone jack, closed frame	Switchcraft 112BX or equivalent.
OUT	1/4" mono	1/4" phone jack, closed frame	Switchcraft 111X or equivalent.
DC	2.1mm	DC jack, 2.1mm panel mount	Mouser 163-4302-E or equivalent.
BATT	Battery snap	9V battery snap	Optional. Use the soft plastic type—the hard-shell type will not fit.
FSW	3PDT	Stomp switch, 3PDT	
ENC	125B	Enclosure, die-cast aluminum	Can also use a Hammond 1590N1.

SCHEMATIC



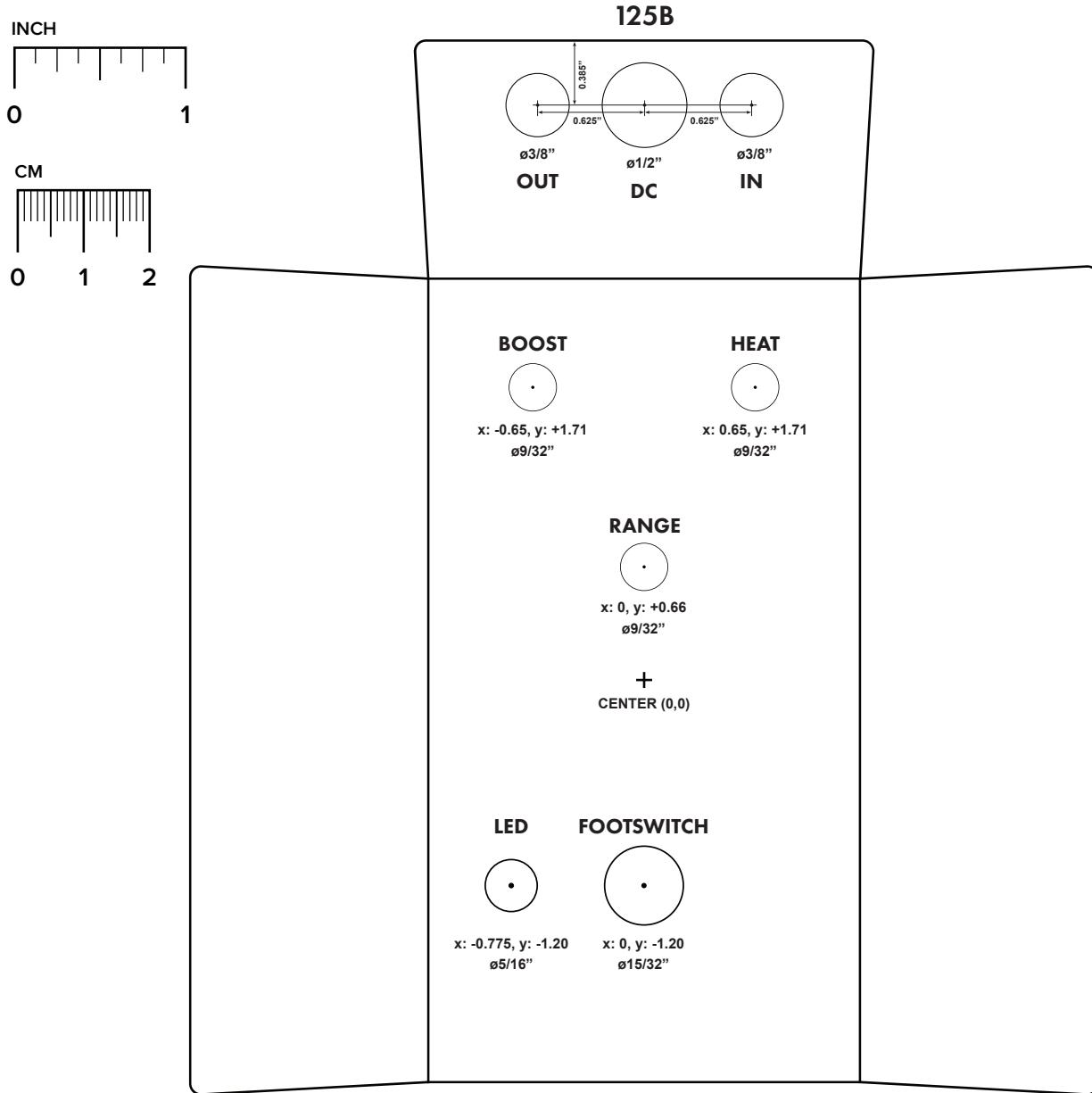
DRILL TEMPLATE

Cut out this drill template, fold the edges and tape it to the enclosure. Before drilling, it's recommended to first use a center punch for each of the holes to help guide the drill bit.

Ensure that this template is printed at 100% or "Actual Size". You can double-check this by measuring the scale on the printed page.

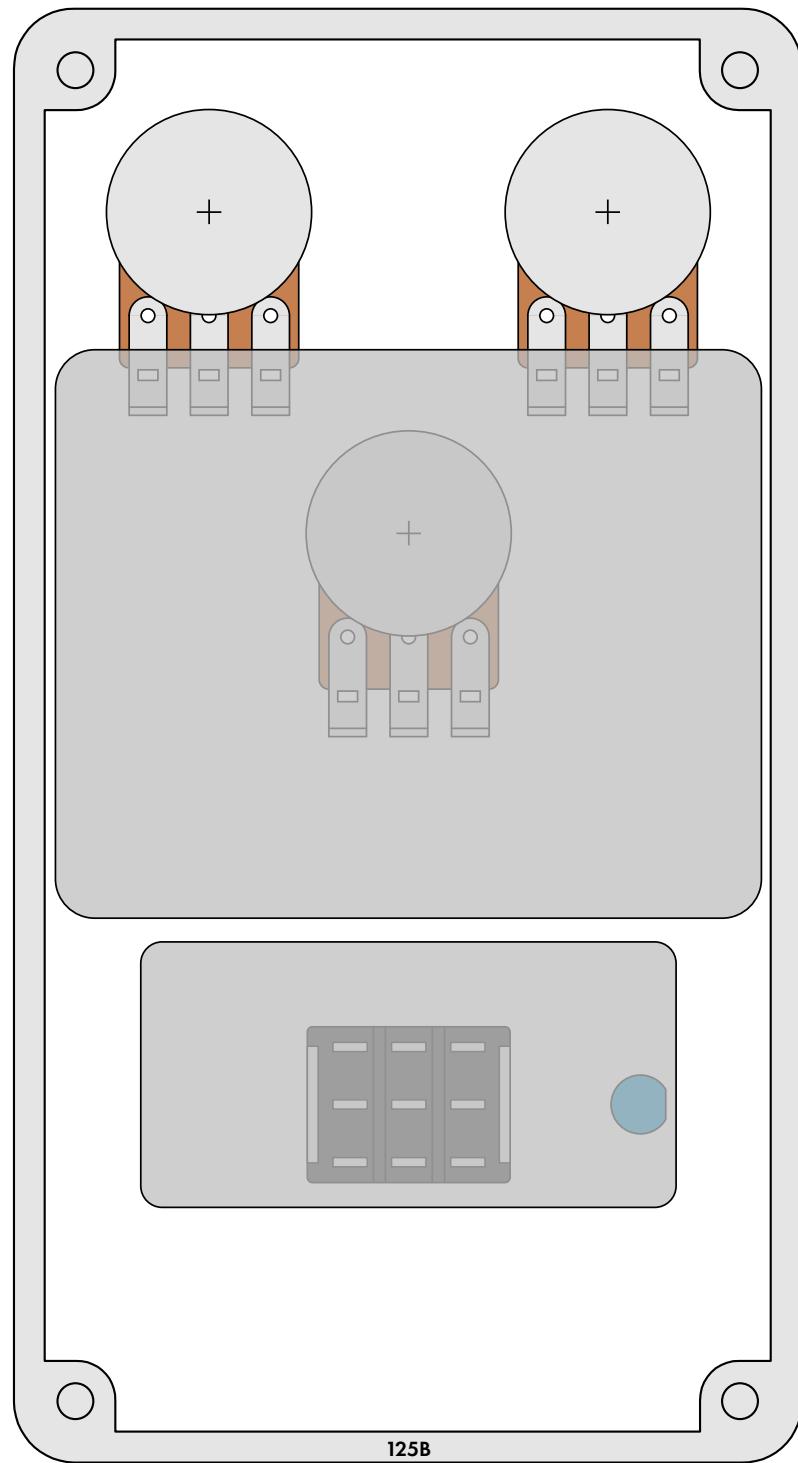
Top jack layout assumes the use of closed-frame jacks like the [Switchcraft 111X](#). If you'd rather use open-frame jacks, please refer to the Open-Frame Jack Drill Template for the top side.

LED hole drill size assumes the use of a [5mm LED bezel](#), available from several parts suppliers. Adjust size accordingly if using something different, such as a 3mm bezel, a plastic bezel, or just a plain LED.

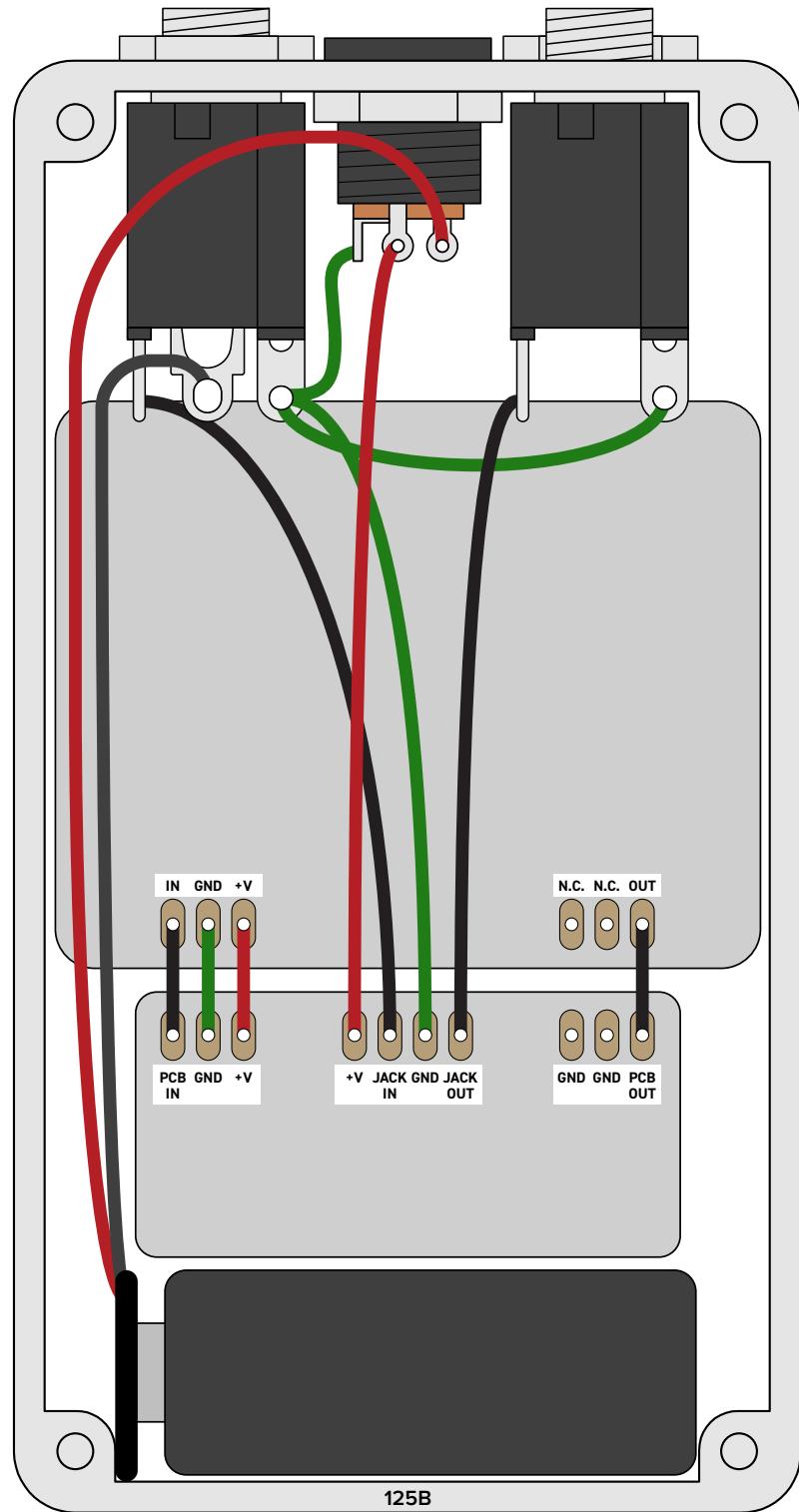


ENCLOSURE LAYOUT

Enclosure is shown without jacks. See next page for jack layout and wiring.



WIRING DIAGRAM



Shown with optional 9V battery. If battery is omitted, both jacks can be mono rather than one being stereo.
Leave the far-right lug of the DC jack unconnected.

LICENSE & USAGE

No direct support is offered for these projects beyond the provided documentation. It's assumed that you have at least some experience building pedals before starting one of these. Replacements and refunds cannot be offered unless it can be shown that the circuit or documentation are in error.

All of these circuits have been tested in good faith in their base configurations. However, not all the modifications or variations have necessarily been tested. These are offered only as suggestions based on the experience and opinions of others.

Projects may be used for commercial endeavors in any quantity unless specifically noted. No attribution is necessary, though a link back is always greatly appreciated. The only usage restrictions are that **(1) you cannot resell the PCB as part of a kit without prior arrangement, and (2) you cannot “goop” the circuit, scratch off the screenprint, or otherwise obfuscate the circuit to disguise its source.** (In other words: you don't have to go out of your way to advertise the fact that you use these PCBs, but please don't go out of your way to hide it. The guitar effects industry needs more transparency, not less!)

DOCUMENT REVISIONS

1.0.0 (2019-11-28)

Initial release.